

CLAIMS

1. A saddle for a backing assembly in a rolling mill; the saddle adjustably supporting a shaft; the saddle comprising:

- 5 a saddle ring having a non-cylindrical inner bearing surface;
 an eccentric adapted to be connected to the shaft;
 the eccentric having a non-cylindrical outer bearing surface that engages
the non-cylindrical inner bearing surface of the saddle ring; and
 the non-cylindrical bearing surfaces being complementary.

10

2. The saddle of claim 1, wherein the non-cylindrical outer bearing surface of the eccentric is convex with respect to the eccentric and wherein the non-cylindrical inner bearing surface of the saddle ring is concave with respect to the saddle ring.

15

3. The saddle of claim 2, wherein the non-cylindrical outer bearing surface of the eccentric is a spherical bearing surface.

20

4. The saddle of claim 2, wherein the saddle ring includes first and second rings with each of the first and second rings defining a portion of the inner bearing surface.

5. The saddle of claim 4, wherein the saddle ring has a radial thickkness; the second ring of the saddle ring having a radial thickness that is less than radial thickness of the saddle ring.

5 6. The saddle of claim 4, wherein the first and second rings of the saddle ring define connector openings that are coaxial when the first and second rings are assembled to form the saddle ring.

10 7. The saddle of claim 1, wherein the non-cylindrical outer bearing surface of the eccentric is concave with respect to the eccentric and wherein the non-cylindrical inner bearing surface of the saddle ring is convex with respect to the saddle ring.

15 8. The saddle of claim 7, wherein the eccentric includes first and second rings with each of the first and second rings defining a portion of the outer bearing surface.

20 9. The saddle of claim 8, wherein the eccentric has a radial thickness; the second ring of the eccentric having a radial thickness that is less than radial thickness of the eccentric.

10. The saddle of claim 8, wherein the first and second rings of the eccentric define connector openings that are coaxial when the first and second rings are assembled to form the saddle ring.

5 11. The saddle of claim 1, further comprising a saddle shoe connected to the saddle ring.

12. A saddle for a backing assembly in a rolling mill; the saddle adjustably supporting a shaft; the saddle comprising:

10 a saddle ring having an inner bearing surface;

an eccentric ring having an outer bearing surface and an inner bearing surface; the eccentric ring being disposed radially inward of the saddle ring;

an eccentric adapted to be connected to the shaft;

15 a plurality of first rollers disposed intermediate the eccentric and the eccentric ring; each of the first rollers having a non-cylindrical bearing surface;

the eccentric having a non-cylindrical outer bearing surface that engages the non-cylindrical bearing surfaces of the first rollers; and

the non-cylindrical bearing surfaces being complementary.

20 13. The saddle of claim 12, wherein the non-cylindrical outer bearing surface of the eccentric is convex with respect to the eccentric and wherein the bearing surface of each first roller is concave.

14. The saddle of claim 13, wherein the non-cylindrical outer bearing surface of the eccentric is a spherical bearing surface.

5 15. The saddle of claim 13, wherein the inner bearing surface of the eccentric ring is convex with respect to the eccentric ring; the convex inner bearing surface of the eccentric ring being complementary to the concave bearing surface of each first roller.

10 16. The saddle of claim 13, further comprising a pair of gear rings connected to the eccentric ring; each of the gear rings defining a roller raceway aligned with each of the first rollers.

15 17. The saddle of claim 16, wherein a portion of each of the first rollers is disposed in each of the roller raceways.

18. The saddle of claim 17, wherein each of the first rollers has cylindrical end portions that are at least partially disposed in the roller raceways.

20 19. The saddle of claim 12, wherein the non-cylindrical outer bearing surface of the eccentric is concave with respect to the eccentric and wherein the non-cylindrical bearing surface of each first roller is convex.

20. The saddle of claim 19, wherein the inner bearing surface of the eccentric ring is concave with respect to the eccentric ring; the concave inner bearing surface of the eccentric ring being complementary to the convex bearing surface of each first roller.

5

21. The saddle of claim 19, wherein one of the eccentric and eccentric ring includes a pair of opposed abutment walls; each of the first rollers being partially disposed between the opposed abutment walls.

10

22. The saddle of claim 12, further comprising a saddle shoe connected to the saddle ring.

23. The saddle of claim 12, further comprising a plurality of second rollers disposed between the saddle ring and the eccentric ring.

15

24. The saddle of claim 12, further comprising a pair of gear rings connected to the eccentric ring; each of the gear rings being spaced from the eccentric.

20

25. The saddle of claim 24, wherein each of the gear rings defines a roller raceway aligned with the plurality of first rollers.

26. The saddle of claim 25, wherein a portion of each of the first rollers is disposed in each of the roller raceways.

27. A saddle for a backing assembly in a rolling mill; the saddle adjustably supporting a shaft; the saddle comprising:

a saddle ring having a non-cylindrical inner bearing surface;

an eccentric ring having an outer bearing surface and an inner bearing surface;

an eccentric adapted to be connected to the shaft; the eccentric disposed radially inwardly of the eccentric ring;

a plurality of first rollers disposed intermediate the saddle ring and the eccentric ring; each of the first rollers having a non-cylindrical bearing surface;

the non-cylindrical inner bearing surface of the saddle ring engaging the non-cylindrical bearing surfaces of the first rollers; and

the non-cylindrical bearing surfaces being complementary.

28. The saddle of claim 27, wherein the non-cylindrical inner bearing surface of the saddle ring is convex with respect to the saddle ring and wherein the bearing surface of each first roller is concave.

29. The saddle of claim 28, wherein the outer bearing surface of the eccentric ring is convex with respect to the eccentric ring; the convex outer bearing surface of the eccentric ring being complementary to the concave bearing surface of each first roller.

5

30. The saddle of claim 29, wherein the non-cylindrical outer bearing surface of the eccentric ring is a spherical bearing surface.

10

31. The saddle of claim 28, further comprising a pair of gear rings connected to the eccentric ring; each of the gear rings defining a roller raceway aligned with each of the first rollers.

15

32. The saddle of claim 31, wherein a portion of each of the first rollers is disposed in each of the roller raceways.

20

33. The saddle of claim 32, wherein each of the first rollers has cylindrical end portions that are at least partially disposed in the roller raceways.

34. The saddle of claim 27, wherein the non-cylindrical inner bearing surface of the saddle ring is concave with respect to the saddle ring and wherein the non-cylindrical bearing surface of each first roller is convex.

35. The saddle of claim 34, wherein the outer bearing surface of the eccentric ring is concave with respect to the eccentric ring; the concave outer bearing surface of the eccentric ring being complementary to the convex bearing surface of each first roller.

5

36. The saddle of claim 34, wherein one of the saddle ring and eccentric ring includes a pair of opposed abutment walls; each of the first rollers being partially disposed between the opposed abutment walls.

10

37. The saddle of claim 27, further comprising a saddle shoe connected to the saddle ring.

38. The saddle of claim 27, further comprising a plurality of second rollers disposed between the saddle ring and the eccentric ring.

15

39. The saddle of claim 27, further comprising a pair of gear rings connected to the eccentric ring; each of the gear rings being spaced from the saddle ring.

40. The saddle of claim 39, wherein each of the gear rings defines a roller raceway aligned with the plurality of first rollers.

20

41. The saddle of claim 40, wherein a portion of each of the first rollers is disposed in each of the roller raceways.